

TEST PROCEDURE FOR EVALUATING THE QUALITY OF FUEL
RESISTANT SEALERS IN THE LABORATORY

1. SAMPLING AND TESTING:

1.1 Sampling: The samples obtained for laboratory testing shall be representative of the material to be used for construction. These samples shall be stored in clean, airtight containers and maintained in a dry environment within a temperature range of 40°F to 120°F. The samples shall be furnished to the testing laboratory at least 30 days prior to planned use.

1.2 Test Methods:

1.2.1 Test Specimens: Test specimens shall consist of PCC concrete base cylinders with a one inch compacted AC cap.

The base cylinder shall be prepared utilizing PCC concrete. Each cylinder shall be 5.95 ± 0.05 inches in diameter with a thickness of 2 ± 0.1 inches. A 6-inch concrete core provides an excellent source for the base cylinders.

AC caps of one inch thickness shall be constructed on the concrete base cylinders. Compaction of the AC caps is accomplished with 10 revolutions of a gyratory compactor (ASTM D 3387) with a one-degree angle of gyration and a 200-psi foot pressure setting of the machine.

The AC specimen cap shall conform to the job mix formula as to gradation and optimum asphalt content. AC 20 asphalt may be used where the type to be used is uncertain.

The controlling criteria for the amount of coating material applied will be based on the manufacturer's recommendation.

After the AC cap to be coated is prepared, the material shall be applied with a brush or sprayed when applicable. Care must be exercised to assure uniform and complete coverage. The test method requires coating the top of the AC and completely covering the sides of the specimens. The final weight of the sealed specimens shall be recorded after the coating dries.

The temperature of all test specimens at the time of testing and during cure periods shall be maintained within a temperature range of $70^{\circ}\text{F} \pm 10^{\circ}$. The time required for a complete cure will depend on the type of material used and

Inclosure 2

ETL-1110-1-125
4 May 84

should be based on the manufacturer*s recommendations. An initial set shall be obtainable within 4 to 24 hours, and the material shall be rejected if it remains tacky after 24 hours. The specimens shall be maintained in a dry environment when not being tested.

1.2.2 Fuel-Drip Test:

The AC core sample is placed under a dripping flow of 1000 ml of fuel contained under 5 ± 0.5 pounds per square inch (psi) of pressure for 10 ± 0.5 minutes.

A container of any convenient size shall be used, provided it can hold a minimum of 1000 ml of Reference Fuel B. This container shall be capable of being pressurized at a constant 5 ± 0.5 psi and possess valving capable of being calibrated to deliver 1000 ml in 10 ± 0.5 minutes. The discharge on this container shall be capable of dripping the fuel to evenly cover the entire core surface for the required time.

The balance shall be capable of weighing 5000 grams to within ± 1.0 grams.

The fuel used in the fuel-drip test shall be Reference Fuel B (70 percent isooctane plus 30 percent toluene, industrial grade) (ASTM 0 471).

A wire mesh or screen shall be used, on which the sample is placed, to allow drainage of fuel away from the sample.

Utilizing the container described above, apply to a sample within 10 ± 0.5 minutes 1000 ml of fuel contained under 5 ± 0.5 psi of pressure. The sample shall be rotated 90 degrees every 2.5 minutes to assure equal fuel coverage to the sample.

Afterward, test the sample by abrasion within 30 ± 1 minutes of completion of the fuel-drip test.

Record any visible damage or loss of AC aggregate from the specimen.¹

1.2.3 Abrasion Test: The specimens shall be tested by abrasion using an adaptation of the "Wet Track Abrasion Test," ASTM 0 3910. The following test method contains sections of ASTM D 3910 either copied verbatim, adapted to this test method, or completely eliminated.

The specimen is abraded at the temperature requirements given in Section 1.2.1. After abrasion, the specimen is dried to a constant weight as specified, and the weight is recorded.

¹ When a specimen loses pieces of aggregate during the fuel test, the abrasion test may be waived and the product failed when approximately 10 percent or more of the AC aggregate is lost.

A balance capable of weighing 5000 grams to within ± 1.0 grams shall be used.

The Planetary Type Mechanical Stirrer² (such as the Hobart C-100 made by Hobart Mfg. Co., Troy, Ohio) shall be equipped with a (5-pound) weighted rubber hose holding device (abrasion head) with approximately $\frac{1}{2}$ inch free up-and-down movement in the shaft sleeve.

A heavy (1/8-inch) flat-bottom metal pan shall be selected that is approximately 13 inches in diameter with 2-inch vertical side walls (20-gage or heavier) having four equispaced screw clamps capable of securing the 11 1/4-inch-diameter specimen holders to the bottom of the pan.

A specimen holder constructed with polymethylmethacrylate (PMMA) shall hold the specimens securely in the metal pan. The device is 1/4 inch in thickness with an outside diameter of 11 inches and an inside diameter of 6.1 ± 0.1 inches to be centered under the rotating head of the mechanical stirrer when the pan is attached to it. This device shall be capable of holding the samples immobile during the abrasion test.

Reinforced rubber hose³ (two braid, 300 psi, green oil-resistant cover), with a 3/4-inch inside diameter and 1-7/32 inch outside diameter, shall be cut into 1-1/2-inch lengths.

Wooden prop block or equivalent is required for supporting the platform assembly into position during testing.

Place the sample in the holder and secure it in the large pan by the provided fasteners. Add water at room temperature to cover the sample by at least 1/4-inch.

Secure the pan containing the specimen on the platform of the device. Lock the rubber hose abrasion head on the shaft of the Hobart machine. Elevate the platform until the rubber hose fully contacts the sample with the total weight of the head on the surface of the specimen. Use the prop block to support the platform assembly during testing.

Switch to the low speed of the machine (approximately 144 shaft rpm at 61 turns of the planetary). Operate the machine for 5 minutes ± 2 seconds running time.⁴

Remove the specimen and rinse it thoroughly with water to remove all loose debris. Then place the specimen in a clean, dry area and allow it to dry to a constant weight.

² The Hobart C-100 stirrer, available from Hobart Manufacturing Co., World Headquarters, Troy, Ohio 45374, has been found suitable.

³ The Uniroyal P-290 general purpose air hose, available from Uniroyal, Inc., P. O. Box 1126, Wall Street Station, New York, NY 10005, has been found suitable.

ETL-1110-1-125
4 May 84

Record the final weight of the specimen after abrasion noting any loss of aggregate particles from the specimen.

2. ACCEPTANCE OF PRODUCT:

2.1 Fuel and Abrasion Resistance:

2.1.1 The product shall be rejected if at any time during the fuel /abrasion tests there is a weight loss (loss of aggregate/coating material) from any of the specimens which exceeds the weight of the coating originally applied. If this weight loss is exceeded on one of the three AC specimens, the product shall be retested.

⁴ Install a fresh section of hose after completion of each test to prevent any material buildup on the base. It is allowable to rotate the hose one-half turn after one test so that two tests can be conducted with each piece of hose.